CLAIMS

What is claimed is:

1. A method of signal processing, comprising:

converting an optical signal into an electrical signal having an amplitude corresponding to optical power of the optical signal; and

sampling the electrical signal using a sampling window to generate a bit sequence corresponding to the optical signal, wherein:

the sampling window has a width;

the electrical signal has a series of waveforms comprising first and second pluralities of waveforms, wherein each waveform of the first plurality represents a binary "0" and each waveform of the second plurality represents a binary "1";

each waveform is integrated over the sampling window width to generate a corresponding bit value; and

the sampling window width is selected to reduce contribution of the second plurality of waveforms into integration results corresponding to the first plurality of waveforms.

2. The method of claim 1, wherein, for each waveform, the integration result is compared with a decision threshold value, wherein:

when the integration result is greater than or equal to the decision threshold value, the bit value is binary "1";

when the integration result is smaller than the decision threshold value, the bit value is binary "0"; and

the decision threshold value is selected to reduce contribution of noise into the integration results corresponding to the first and second pluralities of waveforms.

3. The method of claim 1, wherein the width of the sampling window is selected based on an eye diagram of the optical signal.

4. The method of claim 1, wherein the optical signal is an optical duobinary signal.

5. The method of claim 1, further comprising:

generating a first clock signal based on the electrical signal;

multiplying a frequency of the first clock signal to generate a second clock signal; and

selecting the width of the sampling window using the second clock signal.

6. The method of claim 5, comprising aligning the sampling window with respect to the waveforms based on the second clock signal.

7. The method of claim 1, wherein the sampling window width is selected based on duty cycle corresponding to the second plurality of waveforms.

8. The method of claim 7, wherein the sampling window width is less than about 25% of a bit length.

9. The method of claim 7, wherein the sampling window width is about 10% of a bit length.

10. The method of claim 7, wherein the duty cycle is greater than one.

11. An optical receiver, comprising:

a signal converter adapted to convert an optical signal into an electrical signal having an amplitude corresponding to optical power of the optical signal; and

a decoder coupled to the signal converter and adapted to (i) sample the electrical signal using a sampling window and (ii) generate a bit sequence corresponding to the optical signal, wherein:

the sampling window has a width;

the electrical signal has a series of waveforms comprising first and second pluralities of waveforms, wherein each waveform of the first plurality represents a binary "0" and each waveform of the second plurality represents a binary "1";

each waveform is integrated over the sampling window width to generate a corresponding bit value; and

the sampling window width is selected to reduce contribution of the second plurality of waveforms into integration results corresponding to the first plurality of waveforms.

12. The receiver of claim 11, wherein the decoder is adapted to, for each waveform, compare the integration result with a decision threshold value, wherein:

when the integration result is greater than or equal to the decision threshold value, the bit value is binary "1";

when the integration result is smaller than the decision threshold value, the bit value is binary "0"; and

the decision threshold value is selected to reduce contribution of noise into integration results corresponding to the first and second pluralities of waveforms.

13. The receiver of claim 11, wherein the sampling window width is selected based on an eye diagram of the optical signal.

14. The receiver of claim 11, wherein the optical signal is an optical duobinary signal.

15. The receiver of claim 11, further comprising:

a clock recovery circuit coupled to the signal converter and adapted to generate a first clock signal based on the electrical signal; and

a clock multiplier coupled between the clock recovery circuit and the decoder and adapted to multiply a frequency of the first clock signal to generate a second clock signal, wherein:

the decoder is adapted to select the sampling window width based on the second clock signal.

16. The receiver of claim 15, wherein the decoder is adapted to align the sampling window with respect to the waveforms based on the second clock signal.

17. The receiver of claim 11, wherein the sampling window width is selected based on duty cycle corresponding to the second plurality of waveforms.

18. The receiver of claim 17, wherein the sampling window width is less than about 25% of a bit length.

19. The receiver of claim 17, wherein the sampling window width is about 10% of a bit length.

20. The receiver of claim 17, wherein the duty cycle is greater than one.

21. An optical communication system, comprising an optical transmitter and an optical receiver coupled via a transmission link, wherein the optical receiver comprises:

a signal converter adapted to convert an optical signal received from the transmitter via the transmission link into an electrical signal having an amplitude corresponding to optical power of the optical signal; and

a decoder coupled to the signal converter and adapted to (i) sample the electrical signal using a sampling window and (ii) generate a bit sequence corresponding to the optical signal, wherein:

the sampling window has a width;

the electrical signal has a series of waveforms comprising first and second pluralities of waveforms, wherein each waveform of the first plurality represents a binary "0" and each

waveform of the second plurality represents a binary "1";

each waveform is integrated over the sampling window width to generate a corresponding bit value; and

the sampling window width is selected to reduce contribution of the second plurality of waveforms into integration results corresponding to the first plurality of waveforms.

22. The system of claim 21, wherein the decoder is adapted to, for each waveform, compare the integration result with a decision threshold value, wherein:

when the integration result is greater than or equal to the decision threshold value, the bit value is binary "1";

when the integration result is smaller than the decision threshold value, the bit value is binary "0"; and

the decision threshold value is selected to reduce contribution of noise into integration results corresponding to the first and second pluralities of waveforms.

23. The system of claim 21, wherein the optical signal is an optical duobinary signal.

24. An optical receiver, comprising:

means for converting an optical signal into an electrical signal having an amplitude corresponding to optical power of the optical signal; and

means for sampling the electrical signal to generate a bit sequence corresponding to the optical signal, wherein:

the electrical signal has a series of waveforms comprising first and second pluralities of waveforms, wherein each waveform of the first plurality represents a binary "0" and each waveform of the second plurality represents a binary "1";

each waveform is integrated over a sampling window width to generate a corresponding bit value; and

the sampling window width is selected to reduce contribution of the second plurality of waveforms into integration results corresponding to the first plurality of waveforms.